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Richard Warner

Robert H. Sloan

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Richard Warner[*] *and Robert H. Sloan*[**]

ABSTRACT

When you download the free audio recording software from Audacity, you agree that Audacity may collect your information and use it to send you advertising. Billions of such pay-with-data exchanges feed information daily to a massive advertising ecosystem that tailors website advertising as closely as possible to individual interests. The vast majority of consumers want considerably more control over our information. Consumers nonetheless routinely enter pay-with-data exchanges when we visit CNN.com, use Gmail, or visit any of a vast number of other websites. Why? And, what, if anything, should we do about it? We answer both questions by describing pay-with-data exchanges as a game of Chicken that we play over and over with sellers under conditions that guarantee we will always lose. Chicken is traditionally played with cars. Two drivers at opposite ends of a road drive toward each other at high speed. The first to swerve loses. We play a similar game with advertisers, with one crucial difference: we know in advance that the advertisers will never "swerve."

In classic Chicken with cars, the players' preferences mirror each other. When Phil and Phoebe face each other in their cars, Phil's first choice is that Phoebe swerve first. His second choice is that they swerve simultaneously. Mutual cowardice is better than a collision. Unilateral cowardice is too, so third place goes to his swerving before Phoebe does. Collision ranks last. Phoebe's preferences are the same except that she is in Phil's place and Phil in hers. Change the preferences a bit, and we have the game we play in pay-with-data

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[*] Professor of Law, Chicago-Kent College of Law, Visiting Foreign Professor, University of Gdańsk, Poland. We thank Harold Krent for insightful comments on an earlier draft.

[**] Professor and Head, Department of Computer Science, University of Illinois at Chicago. Partially supported by National Science Foundation Grant Nos. IIS-0959116 and DGE-1069311.

exchanges. Phil's preferences are the same, but Phoebe's differ. She still prefers that Phil swerve first, but collision is in second place. Given these preferences, Phoebe will never swerve. Phil knows Phoebe has these preferences, so he knows he has only two options: he swerves, and she does not; or, neither swerves. Since he prefers the first, he will swerve. Call this "One-Sided Chicken."

We play One-Sided Chicken when in our website visits, we enter pay-with-data exchanges. We argue that buyers' preferences parallel Phil's, while the sellers' parallel "collision second" Phoebe's. We name the players' choices in this pay-with-data game "Give In," (the "swerve" equivalent) and "Demand" (the "do not swerve" equivalent). For buyers, "Demand" means refusing to use the website unless the seller's data-collection practices conform to the buyer's informational-privacy preferences. "Give In" means permitting the seller to collect and process information in accord with whatever information-processing policy it pursues. For sellers, "Demand" means refusing to alter their information-processing practices even when they conflict with a buyer's preferences. "Give In" means conforming information processing to a buyer's preferences. We contend that sellers' first preference is to demand while buyers give in, and that sellers' second preference is the "collision" in which both sides demand. Such demanding sellers leave buyers only two options: give in and use the site, or demand and do not use the site. Since buyers prefer the first option, they will always give in.

It would be better if buyers were not locked into One-Sided Chicken. Ideally, informational norms should regulate the flow of personal information. Informational norms are norms that constrain the collection, use, and distribution of personal information. We contend that such norms would ensure free and informed consent to businesses' use of consumer data. Unfortunately, pay-with-data exchanges are one of a number of situations in which rapid advances in information-processing technology have outrun the slow evolution of norms. We argue that, in a sufficiently competitive market, the needed norms would arise if we had adequate tracking-prevention technologies.

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You download the free audio recording software from Audacity.[1] Your transaction is like any traditional provision of a product for free or for a fee, with one difference: you agree that Audacity may collect your information and use it to send you advertisements.[2] Billions of such pay-with-data exchanges occur daily.[3] They feed information to a complex advertising ecosystem that constructs individual profiles for "behavioral advertising."[4] Behavioral advertising is "the tracking of consumers' online activities

1. AUDACITY: FREE AUDIO EDITOR AND RECORDER, http://audacity.sourceforge.net (last visited Sept. 6, 2012).

2. *Privacy Policy*, AUDACITY, http://audacity.sourceforge.net/contact/privacy (last visited Sept. 6, 2012).

3. *See* Tania Karas, *10 Things Online Data Collectors Won't Say*, SMARTMONEY.COM (Apr. 5, 2012, 12:34 PM), http://www.smartmoney.com/spend/technology/10-things-online-data-collectors-wont-say-1333598586287.

4. *See* Paul M. Schwartz & Daniel J. Solove, *The PII Problem: Privacy and a New Concept of Personally Identifiable Information*, 86 N.Y.U. L. REV. 1814, 1852-53 (2011).

in order to deliver tailored advertising."[5] It merges our digital footprints into pictures of surprising intrusiveness and accuracy. Advertisers can determine where you work, how and with whom you spend your time, and "[w]ith 87% certainty . . . where you'll be next Thursday at 5:35 p.m."[6] The consequence is a startling loss of informational privacy. Informational "[p]rivacy is the claim of individuals, groups, or institutions to determine *for themselves* when, how, and to what extent information about them is communicated to others."[7] *Others* now have considerable power to collect, analyze, and use our information.[8] We—most of us—want considerably more control over our information than the advertising ecosystem allows.[9] But we also want the advantages information processing secures: increased availability of relevant information, increased economic efficiency, improved security, and personalization of services.[10] We

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5. FED. TRADE COMM'N, FTC STAFF REPORT: SELF-REGULATORY PRINCIPLES FOR ONLINE BEHAVIORAL ADVERTISING 2 (2009), http://www.ftc.gov/os/2009/02/P085400behavad report.pdf [hereinafter FTC STAFF REPORT].

6. Lucas Mearian, *Big Data to Drive a Surveillance Society*, COMPUTERWORLD (Mar. 24, 2011, 1:23 PM), http://www.computerworld.com/s/article/9215033/Big_data_to_drive_a_surveillance_society.

7. ALAN F. WESTIN, PRIVACY AND FREEDOM 7 (1967) (emphasis added).

8. We do not distinguish between personally identifying information (PII) and non-PII, because recent advances in de-anonymization ensure that, in many cases, non-PII may in fact identify individuals. *See, e.g.*, Arvind Narayanan & Vitaly Shmatikov, *Robust De-anonymization of Large Sparse Datasets*, 2008 IEEE SYMPOSIUM ON SECURITY AND PRIVACY 111 (2008); Schwartz & Solove, *supra* note 4, at 1814.

9. This is the most plausible interpretation of over twenty years of studies and surveys about consumer attitudes toward privacy. For an excellent collection of relevant studies, see *The Economics of Privacy*, CARNEGIE MELLON UNIV., http://www.heinz.cmu.edu/~acquisti/economics-privacy.htm (last visited Sept. 6, 2012). For a useful summary of consumer attitudes in this regard, see Joshua Gomez et al., *Know Privacy*, UNIV. CAL. BERKLEY, SCH. OF INFO. (June 1, 2009), http://knowprivacy.org/report/KnowPrivacy_Final_Report.pdf. For discussion and interpretation, see Richard Warner, *Undermined Norms: The Corrosive Effect of Information Processing Technology on Informational Privacy*, 55 ST. LOUIS U. L.J. 1047-48 (2011) [hereinafter *Undermined Norms*].

10. For a discussion of the advantages (other than personalization of services), see Jerry Kang, *Information Privacy in Cyberspace Transactions*, 50 STAN. L. REV. 1193 (1998) (emphasizing availability of relevant information, increased economic efficiency, and improved security). For a discussion of consumer willingness to trade privacy for various benefits, see Karl W. Lendenmann, *Consumer Perspectives on Online Advertising—2010*, PREFERENCECENTRAL 3 (2010), http://www.preferencecentral.com/consumersurvey/download ("Over half of consumers surveyed indicated that they prefer relevant targeted online ads as a trade-off for access to free content."), and CHOICESTREAM, INC., *2006 ChoiceStream Personalization Survey*, http://www.choicestream.com/pdf/ChoiceStream_PersonalizationSurveyResults2006.pdf (last visited Sept. 7, 2012) (claiming that only 15 percent of web users would give up personalization benefits to avoid revealing personal details). *But see* Joseph Turow et al., *Americans Reject Tailored Advertising and Three Activities that Enable It* (Soc. Sci. Research Network, Working Paper, 2009), *available at* http://ssrn.com/abstract=1478214 (arguing that the vast majority of consumers find behavioral advertising unacceptable). The opposing studies illustrate the well-known truth about surveys: what you ask determines what you get. Still, the most reasonable

are willing to trade some privacy for some of the advantages, but we want a better trade-off than the control-depriving one businesses currently impose on us. Our misgivings are evidently idle, however. We routinely enter pay-with-data exchanges when we visit CNN.com, use Gmail, or visit any of a vast number of other websites.[11] Why? And, what should we do about it?

We answer both questions by describing pay-with-data exchanges as a game of Chicken that we play repeatedly under conditions that guarantee that we will always lose. Chicken is traditionally played with cars.[12] Two drivers speed toward each other; the first to swerve loses. We play a similar game with sellers, with one crucial difference: we know in advance that the sellers will never "swerve." We will call this game "One-Sided Chicken."

How do we escape One-Sided Chicken and regain an appropriate degree of control over our information? Regaining control means ensuring ourselves a sufficiently broad ability to give free and informed consent to information processing; otherwise, we lack sufficient ability to determine—by and for ourselves—what information others collect about us, and how they use and distribute it. Currently, businesses purport to obtain consent through "Notice and Choice."[13] The "notice" is the presentation of information

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interpretation of the surveys is that consumers (more or less) reject the current privacy/efficiency trade-off and want a trade-off that gives them more control over their privacy.

11. *See, e.g.*, Wendy Schuchart, *Google Privacy Policy Changes? Get Over It*, IT KNOWLEDGE EXCHANGE (Jan. 27, 2012, 2:22 PM), http://itknowledgeexchange.techtarget.com/cio/google-privacy-policy-changes-get-over-it ("Facebook basically knows enough about me to successfully predict what I'm going to wear tomorrow, yet we all grudgingly accept Zuckerberg's evil empire and go on with our status updates.").

12. The 1955 film classic, *Rebel Without a Cause*, popularized the game of Chicken. In the film, Jim Stark (James Dean) races Buzz toward a cliff edge; the first to jump out loses. REBEL WITHOUT A CAUSE (Warner Bros. Pictures 1955). Bertrand Russell popularized the "drive toward each other" version when he described the mid-twentieth century nuclear brinksmanship policies of the United States and the Soviet Union as a game of Chicken. *See* BERTRAND RUSSELL, COMMON SENSE AND NUCLEAR WARFARE 29-31 (1959). There is a very readable discussion of the game of chicken in WILLIAM POUNDSTONE, PRISONER'S DILEMMA 197-201 (1992). Chicken, also known as Hawk-Dove, is a standard game-theory game. *See, e.g.*, KEVIN LEYTON-BROWN & YOAV SHOHAM, ESSENTIALS OF GAME THEORY: A CONCISE, MULTIDISCIPLINARY INTRODUCTION 29, 80 (2008); MARTIN J. OSBORNE & ARIEL RUBINSTEIN, A COURSE IN GAME THEORY 16-17 (1994).

13. For a description and criticism of Notice and Choice, see Comments of The Center for Digital Democracy & U.S. PIRG, *In re* A Preliminary FTC Staff Report on Protecting Consumer Privacy in an Era of Rapid Change: A Proposed Framework for Businesses and Policymakers (Feb. 18, 2011), http://www.ftc.gov/os/comments/privacyreportframework/00338-57839.pdf [hereinafter Center for Digital Democracy Comments]. *See also* J. Howard Beales III & Timothy J. Muris, *Choice or Consequences: Protecting Privacy in Commercial Information*, 75 U. CHI. L. REV. 109, 112-14 (2008); Paul M. Schwartz, *Internet Privacy and the State*, 32 CONN. L. REV. 815, 822-23 (2000); *cf.* Paul Ohm, *The Rise and Fall of Invasive ISP Surveillance*, 2009 U. ILL. L. REV. 1417, 1496 (endorsing a limited notice-and-choice regime).

(typically in a privacy policy and terms-of-use agreement), while the "choice" is a consumer action (typically using the site, or clicking on an "I agree" button), which is interpreted as the choice to proceed under the presented terms.[14] As we have argued elsewhere and will assume here, "notice and choice" is clearly inadequate.[15] It does not ensure informed consent: people do not read and acquire the information necessary to make informed choices.[16] Moreover, it *cannot* ensure informed consent; as Daniel Solove and others have emphasized, you need information about unpredictable future uses of your data to make an informed choice, and you cannot know what you cannot know.[17] Even if it were possible, and even if people made the effort to be informed, notice and choice should not be the mechanism we use. There is no reason to think that the combined result of the individual choices would yield the socially optimal trade-off between privacy and the goals served by collecting information.[18]

The key to achieving free and informed consent lies instead in informational norms.[19] Informational norms are social norms that constrain the collection, use, and distribution of personal information.[20] Such norms explain, for example, why your pharmacist may inquire about the drugs you are taking but not about whether you are happy in your marriage. Norm-governed exchanges not only implement acceptable trade-offs between informational privacy and competing goals, but they also ensure that we give free and informed consent to those trade-offs.[21] Unfortunately, rapid advances in information-processing technology have greatly outpaced the relatively slow evolution of norms, and lacking norms, we lack any adequate way to give free and informed consent to acceptable privacy trade-offs. The right response is to create the necessary norms, and we will suggest an appropriate norm-generation process.

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14. *See* Schwartz, *supra* note 13, at 824 ("[W]hen a Web site says something about its data processing practices—even if this statement is vague or reveals poor practice—the visitor to the site is deemed to be in agreement with these practices so long as she sticks around. This summary, despite its ironic tone, is no exaggeration.").

15. *See* Richard Warner & Robert Sloan, *The Undermining Impact of Information Processing on Informational Privacy*, *in* RIGHTS OF PERSONALITY IN THE XXI CENTURY (Justyna Balcarczyk ed., 2012) [hereinafter *The Undermining Impact of Information Processing*]; RICHARD WARNER & ROBERT SLOAN, UNAUTHORIZED ACCESS: THE CRISIS IN ONLINE PRIVACY AND INFORMATION SECURITY (forthcoming 2012) [hereinafter UNAUTHORIZED ACCESS].

16. Beales & Muris, *supra* note 13, at 135.

17. Daniel J. Solove, *Privacy and Power: Computer Databases and Metaphors for Information Privacy*, 53 STAN. L. REV. 1393, 1452 (2001).

18. *See The Undermining Impact of Information Processing*, *supra* note 15; UNAUTHORIZED ACCESS, *supra* note 15.

19. *See infra* Part III.C.

20. *See infra* Part III.C.

21. *See infra* Part III.E.

It may seem to some that all we are doing is offering an unnecessarily complicated description of a collective action problem. Collective action problems are situations in which everyone is worse off if everyone does what he individually prefers to do.[22] For example, everyone is better off if (almost) nobody litters, but, in the 1950s, almost everyone littered, and, as long as almost everyone else did, everyone preferred littering to taking the time and effort to use waste receptacles.[23] Creating the appropriate collective action—almost everyone uses waste receptacles—eliminates littering.[24] Is not the same true of pay-with-data exchanges? Everyone prefers to acquiesce to pay-with-data information processing as long as everyone else does, but everyone would be better off with a better trade-off between privacy and competing concerns.[25] And, like littering, can we not eliminate the problem through appropriate collective action—a consumer boycott, for example? So why do we need a more complicated description than this?

The advantage of the One-Sided Chicken description is that it characterizes the preferences of consumers and advertisers in a way that reveals how we need to alter those preferences to solve the problem.[26] Solving the problem requires more than merely convincing buyers to act in concert—more than a mere boycott, for example. Sellers would almost certainly be likely to respond to such a boycott by offering information processing more closely tailored to individual buyers' preferences.[27] There would, however, be no assurance that the new trade-off between privacy and business concerns would be socially optimal. Sellers would make the minimum concessions necessary to end the boycott expeditiously, and, of course, the concessions might slowly disappear once the boycott ended. In addition, the privacy trade-off would still be a take-it-or-leave-it trade-off that sellers unilaterally impose, not one to which consumers freely give informed

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22. *See* Katharina Holzinger, *The Problems of Collective Action: A New Approach* (Soc. Sci. Research Network, Working Paper, 2003), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=399140 (discussing various definitions of collective action problems). *See generally* MANCUR OLSEN, THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS (1971).

23. *See* EARTHTALK, *Litter Trashes the Environment*, ABOUT.COM, http://environment.about.com/od/pollution/a/litter.htm (last visited Sept. 7, 2012).

24. *See id. But see* Richard H. McAdams, *The Origin, Development, and Regulation of Norms*, 96 MICH. L. REV. 338, 353 (1997).

25. *See* Schwartz, *supra* note 13, at 822.

26. For a general discussion of the usefulness of game theory in analyzing collective action problems, see Austin Rathe, *Is Game Theory a Useful Tool for Collective Action Problems?*, RATHE (June 8, 2011, 5:12 PM), http://www.rathe.co.uk/austin-rathe/2011/6/8/is-game-theory-a-useful-tool-for-collective-action-problems.html.

27. It is unclear how long the personalized processing would last once the boycott ended.

consent. Our One-Sided Chicken analysis shows that, to solve the problem, we need to create a permanent threat that consumers will deny access to the data needed for behavioral advertising and thereby alter preferences in ways that permit buyers to give free and informed consent to privacy trade-offs. The way to achieve this result, we contend, is to empower buyers with "do not track" technologies.[28] An appropriate informational norm will arise as a result. The norm will ensure that buyers give free and informed consent to acceptable privacy trade-offs.[29]

But are we not still ignoring another possibility? Why bother with norms? Why not solve the problem with legal regulation that ensures that buyers give free and informed consent to acceptable privacy trade-offs? But how are we to implement this suggestion? Current privacy regulation in the United States is an unsystematic patchwork.[30] It fails to define acceptable privacy trade-offs for pay-with-data exchanges,[31] and it has no workable mechanism to ensure free and informed consent. As we argued earlier, the Notice-and-Choice regime currently favored in legal regulation cannot possibly ensure free and informed consent. We see no reason to think this will change soon.

Part I provides a brief description of the online advertising ecosystem. Part II presents the game of Chicken, both the classic version with cars, and the One-Sided version we currently play in pay-with-data exchanges. We contend that consumers will remain trapped in the game unless we can empower them by giving them choices that the current online advertising system denies them. We propose to empower consumers with effective "do not track" technologies. We claim that consumers' use of effective "do not track" technologies would, in a sufficiently competitive market, result in an informational norm. In Part III, we explain the relevant notion of an informational norm. We also introduce the key concept of a *value-optimal* norm. Value-optimal informational norms guarantee free and informed consent to acceptable trade-offs between informational privacy and competing concerns. We lack relevant value-optimal informational norms governing pay-with-data

28. *See infra* Part VI.

29. For a general discussion of the role of social norms in solving collective action problems, see Cass R. Sunstein, *Social Norms and Social Roles*, 96 COLUM. L. REV. 903, 953-64 (1996).

30. *See, e.g.*, HELEN NISSENBAUM, PRIVACY IN CONTEXT: TECHNOLOGY, POLICY, AND THE INTEGRITY OF SOCIAL LIFE 1-20 (2010); DANIEL J. SOLOVE, UNDERSTANDING PRIVACY 1-11 (2008); Joel R. Reidenberg, *Privacy Wrongs in Search of Remedies*, 54 HASTINGS L.J. 877 (2003).

31. *See Undermined Norms*, *supra* note 9; Narayanan & Shmatikov, *supra* note 8, Schwartz & Solove, *supra* note 4; *see also supra* text accompanying notes 6-9.

exchanges, and the result is that we lack any viable means to give adequately free and informed consent to trade-offs between privacy and competing concerns that businesses unilaterally impose on us in pay-with-data exchanges. The solution is to generate the necessary norms. Part IV introduces the standard economic notion of perfect competition. We show that if consumers have effective "do not track" technologies, then, under conditions of perfect competition, a value-optimal informational norm governing pay-with-data exchanges will arise. Perfect competition is an ideal that real markets only approximate, and, in Part V, we show how to replicate our norm-generation result in real markets. We conclude in Part VI with a very brief consideration of the prospects for developing close to perfect "do not track" technologies.

I. THE ONLINE ADVERTISING ECOSYSTEM

We present a simplified model of the advertising ecosystem consisting of just five entities: profilers, advertising agencies, advertising networks or exchanges, websites that display the advertisements, and businesses that purchase the advertisements.[32] A single entity may perform more than one role, but we may ignore that complication for the purposes of this model.

A. A Simple Ecosystem Model

Profilers create profiles that segment buyers into groups in order to predict their willingness to buy specific types of products and services.[33] eXelate, for example, has agreements with hundreds of websites that allow it to collect information about age, sex, ethnicity, marital status, profession, Internet search information, and information about sites visited.[34] It combines this data with data from offline sources.[35] eXelate explains,

> We are capturing billions of deep granular data points . . . . We analyze [these data points] . . . and roll them into specific Targeting Segments . . . . These categorizations include Demographic data . . . , consumer Interest data gathered from specific site

32. Models may distinguish several more entities and functions. For example, some make a subtle distinction between advertising networks and advertising exchanges. *See, e.g.*, *Data Usage & Control Primer: Best Practices & Definitions*, INTERACTIVE ADVER. BUREAU 12 (2010), http://www.iab.net/media/file/data-primer-final.pdf.

33. *See* Mark MacCarthy, *New Directions in Privacy: Disclosure, Unfairness and Externalities*, 6 I/S: J.L. & POL'Y FOR INFO. SOC'Y 425, 462-64 (2011).

34. *See* Emily Steel, *Exploring Ways to Build a Better Consumer Profile*, WALL ST. J., Mar. 15, 2010, http://online.wsj.com/article/SB10001424052748703447104575117972284656374.html.

35. *See id.*

> activity . . . (such as parenting and auto enthusiast sites), and deep purchase Intent data culled from relevant . . . activity on top transactional sites. We further segment and sub-segment this data into relevant buckets that in many cases drill down to the product and keyword level.[36]

Profiles routinely identify particular individuals, despite frequent claims to the contrary from practitioners of behavioral advertising.[37] TARGUSinfo, for example, boasts that "[w]ith our authoritative data and proprietary linking logic, no other company can match our ability to accurately identify businesses and consumers in real time—helping you target and recognize your best prospects, even at the moment of live interaction."[38] The data includes "names, addresses, landline phone numbers, mobile phone numbers, email addresses, IP addresses and predictive attributes."[39] The purpose of the profiles is to target display advertising.[40] A business may create its own display advertising, or it may outsource that to an advertising agency.[41]

Advertising exchanges and networks, such as Google's AdSense, deliver display advertisements to the websites that display them.[42] When a buyer visits a website, an advertising exchange combines the buyer's profile with information about his or her current website activity in order to more precisely target advertisements.[43] The exchange then conducts an auction in which businesses bid for the opportunity to present their targeted advertisements (the whole process takes milliseconds).[44] As one commentator aptly sums up the situation, "Advertisers bid against each other in real time for the ability to direct a message at a single Web surfer."[45] The goal is to

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36. *Rev Share and Rental Pricing Models Bring Accountability to eXelate Data Exchange Says CEO Zohar*, ADEXCHANGER (May 28, 2009, 7:20 AM), http://www.adexchanger.com/data-exchanges/data-exchange-exelate-zohar.

37. *See* Center for Digital Democracy Comments, *supra* note 13, at 15-20.

38. TARGUSinfo, *On-Demand Scoring*, http://www.targusinfo.com/solutions/scoring/on-demand-scoring (last visited Sept. 8, 2012).

39. TARGUSinfo, *Our Data: Not All Data Is Created Equal*, http://www.targusinfo.com/about/data (last visited Sept. 8, 2012).

40. *See* Dustin D. Berger, *Balancing Consumer Privacy with Behavioral Targeting*, 27 SANTA CLARA COMPUTER & HIGH TECH. L.J. 3, 4 (2011) ("These profiles allow websites and ISPs to serve advertisements and other services that are targeted to their customers' interests.").

41. For examples of advertising agencies, see Epsilon, *Strategy & Analytics*, http://www.epsilon.com/analytic-focused-services; Havas Media, *Our Group*, http://www.havasmedia.com/our-group; Omnicom Group, *National Advertising Agencies*, http://www.omnicomgroup.com/our companies/nationaladvertisingagencies.

42. *See AdSense Basics*, GOOGLE, http://support.google.com/adsense/bin/answer.py?hl=en&answer=9712 (last visited Sept. 21, 2012).

43. *See* Schwartz & Solove, *supra* note 4, at 1851-52.

44. *See id.* at 1852.

45. Garett Sloane, *amNY Special Report: New York City's 10 Hottest Tech Startups*, AMNY (Jan. 25, 2010), http://www.amny.com/urbanite-1.812039/amny-special-report-new-york-city-s-10-hottest-tech-startups-1.1724369.

tailor advertisements as closely as possible to the interests of the buyer receiving them.[46] Datran Media, for example, promises "to identify who is visiting your Web site, who is being exposed to your advertisers' campaigns, and who is responding to specific ads. Real-time reports paint an accurate picture of whom your audience really is and who is responding to your communications—at the household level!"[47] The amount of information processed is immense. Right Media Exchange processes 9 billion advertising purchases daily;[48] MediaMath, 13 billion daily;[49] TARGUSinfo, 62 billion a year;[50] and Pubmatic, one hundred thousand per second.[51] The number of Google's AdSense transactions is not available, but it is a network of 1.5 million websites and advertisers.[52] Participation in AdSense is free for the seller and a route into the advertising ecosystem for small businesses and free giveaways like Audacity.[53]

Widespread participation in the advertising ecosystem makes it quite difficult for buyers to find websites that will conform to their privacy preferences. The lack of buyer choice plays a key role in our characterization of pay-with-data exchanges as a game of One-Sided Chicken.

B. Buyers' Lack of Choice

Buyers lack choice because, although *advertising* is personalized, *information processing* is not. Information processing does not vary to conform to the privacy preferences of individual buyers. Efficient information processing requires standardized, automated routines using supercomputing power and advanced statistical techniques to analyze vast collections of a complex mix of

46. *See Aperture: Audience Measurement*, DATRAN MEDIA, http://web.archive.org/web/20100222080259/http://www.datranmedia.com/aperture/audience-measurement/index.php?showtype=for-publishers (last visited Sept. 12, 2012).

47. *Id.*

48. Complaint, Request for Investigation, Injunction and Other Relief at 2, *In re* Real-time Targeting and Auctioning, Data Profiling Optimization, and Economic Loss to Consumers and Privacy, F.T.C. (Apr. 8, 2010), *available at* http://www.centerfordigitaldemocracy.org/sites/default/files/20100407-FTCfiling.pdf.

49. *Id.*

50. *Id.*

51. *Id.*

52. Helen Leggatt, *Google Discloses Size of Its Ad Network*, BIZREPORT (May 26, 2010), http://www.bizreport.com/2010/05/google-discloses-size-of-its-ad-network.html.

53. *AdSense Revenue: Do I Have to Pay to Use AdSense?*, GOOGLE, http://support.google.com/adsense/bin/answer.py?hl=en&answer=32850 (last visited Sept. 24, 2012).

data from a variety of online and offline sources.[54] Marketing objectives—not buyers' privacy preferences—drive the collection, analysis, and use of vast amounts of diverse types of information.[55] As the CEO of the advertising exchange Rocket Fuel notes, the company's "technology drives results for advertisers by automatically leveraging massive amounts of internal and third-party external data and serving only the best impressions *in the context of each advertiser's unique marketing objectives*."[56]

Sellers do not tailor their information processing to buyers' privacy preferences because they do not need to. As we explain in detail in the next section, the vast majority of buyers acquiesce in information-processing practices, thereby guaranteeing sellers significant advertising revenues. Thus, sellers can easily afford to ignore the relatively few buyers who refuse to do business with them unless they adjust their information-processing practices.[57] But even so, shouldn't we expect some sellers to break the mold to win business by catering to privacy preferences? That expectation would be disappointed.[58] Sellers do not break the mold—not if they rely on advertising as a significant source of revenue.[59] Participation in the ecosystem gives a seller a competitive edge over nonparticipants by

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54. *See, e.g.*, *Rocket Fuel CEO John Says Ad Exchanges More Like a Technology Platform than Media Source*, ADEXCHANGER (Aug. 24, 2009, 6:07 AM), http://www.adexchanger.com/ad-networks/rocket-fuel-ad-exchanges.

55. *See id.* (describing marketing objectives but not mentioning buyers' privacy preferences).

56. *Id.* (emphasis added).

57. One study may suggest the opposite. *See* Sören Preibusch & Joseph Bonneau, *The Privacy Landscape: Product Differentiation on Data Collection* (The Tenth Workshop on the Econ. of Info. Sec., Working Paper, 2011), *available at* http://weis2011.econinfosec.org/papers/The%20privacy%20landscape%20-%20Product%20differentiation%20on%20data%20col.pdf. The study shows that when buyers can detect differences in the privacy characteristics of goods and services, sellers offering roughly homogeneous goods and services try to differentiate themselves by catering to privacy preferences. *Id.* at 3. There is no inconsistency with our claims, however. The study considered only the amount of personal information requested for registration (if any) in mandatory or optional fields and whether the website had a privacy policy. *Id.* at 5. The study did not "include technical data collected implicitly such as a users' IP address or stored third-party cookies." *Id.* Since such information is critical for behavioral advertising, we cannot infer from the study that websites would differentiate with regard to such data (even if visitors were able to detect whether the website collected it).

58. *See* Felicia Williams, *Internet Privacy Policies: A Composite Index for Measuring Compliance to the Fair Information Principles*, F.T.C. (2006), http://www.ftc.gov/os/comments/behavioraladvertising/071010feliciawilliams.pdf ("The vast majority of the privacy policies stated the firms have the right to share any data with any third party for any reason.").

59. Not all sellers do. Dropbox's revenue model, for example, relies on user fees for data storage to generate revenue. *See 10 Revenue Models for Social Media Startups*, STARTUPFREAK (Aug. 30, 2012), http://www.startupfreak.com/10-revenue-models-for-social-media-startups.

making it a more attractive advertising platform.[60] To compete, other sellers must also participate, and, to gain an edge, they may need to adopt even more privacy-invasive practices. The result is a "race to the bottom."[61]

II. THE GAME OF CHICKEN

We characterize Chicken, in both its classic and One-Sided forms, by describing the preferences of the players. Our characterization of the preferences for One-Sided Chicken shows what needs to be changed to escape that game.

A. Classic and One-Sided Chicken

In classic Chicken with cars, the players' preferences are mirror images of each other. Imagine, for example, Phil and Phoebe face each other in their cars. Phil's first choice is that Phoebe swerve first. His second choice is that they swerve simultaneously; mutual cowardice is better than a collision. Unilateral cowardice is preferable to a collision, as well, so Phil's third place choice is to swerve before Phoebe does. Collision ranks last. Phoebe's preferences are the same as Phil's, except that she is in Phil's place and Phil in hers.

Change the preferences a bit, and we have the game we play in pay-with-data exchanges. Phil's preferences are the same, but Phoebe's differ. She still prefers that Phil swerve first, but collision is in second place, before any scenario in which she swerves. To introduce a theme to which we will return, suppose Phoebe was recently jilted by her lover; as a result, her first choice is to make her male opponent reveal his cowardice by swerving first, but her second choice is a collision that will kill him and her broken-hearted self. Given these preferences, Phoebe will never swerve. Phil knows Phoebe has these preferences, so he knows he has only two options: he swerves, and she does not, or neither swerves. Since he prefers the first option, he will swerve. Call this game "One-Sided Chicken."[62]

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60. *A Race to the Bottom: Privacy Ranking of Internet Service Companies*, PRIVACY INT'L (June 9, 2007), http://www.privacyinternational.org/reports/a-race-to-the-bottom-privacy-ranking-of-internet-service-companies/a-consultation-report-0.

61. *Id.*

62. *See* EVELYN C. FINK ET AL., GAME THEORY TOPICS: INCOMPLETE INFORMATION, REPEATED GAMES AND N-PLAYER GAMES 14 (1998). Poundstone discusses feigning to have the preferences of collision-second Phoebe as a strategy for classic Chicken. *See* POUNDSTONE, *supra* note 12, at 197-201. To the best of our knowledge, very little has been written about One-Sided Chicken, perhaps because it is such a simple game with just one Nash equilibrium, and that one being a pure-strategy equilibrium. Discussions of Chicken itself are not uncommon. *See, e.g.*,

B. Pay-With-Data Exchanges as One-Sided Chicken

Buyers play One-Sided Chicken when we enter pay-with-data exchanges. We argue that buyers' preferences parallel Phil's while the sellers' preferences parallel heart-broken, "collision-second" Phoebe's. We name the players' choices in this pay-with-data game "Give In" (the "swerve" equivalent) and "Demand" (the "do not swerve" equivalent). For buyers, "Demand" means refusing to use the website unless the seller's data-collection practices conform to the buyer's informational-privacy preferences. "Give In" means permitting the seller to collect and process information in accord with whatever information-processing policy it pursues. For sellers, "Demand" means refusing to alter their information-processing practices even when they conflict with a buyer's preferences. "Give In" means conforming information processing to a buyer's preferences. We contend that sellers' first preference is to demand while buyers give in, and that sellers' second preference is the "collision" equivalent, in which both sides demand. Such demanding sellers leave buyers only two options: give in and use the site, or demand and do not. Since buyers prefer the first option, they always give in.

1. Buyers' Preferences

Buyers' preferences parallel Phil's. A buyer's first choice is to demand and have the seller gives in—"(Demand, Give In)" for short. We will use this short form from now on, and will always understand "(buyer action, seller action)" to be the order. (Demand, Give In) is the buyer's first choice because it means that the buyer is sure to receive information processing consistent with his or her preferences.

The buyer's second choice is (Give In, Give In). The buyer gets two things: preference-conforming information processing and a certain attitude—"I insist on conformity to my standards." A buyer might very well prefer the "I insist" attitude to the "I will conform if need be" attitude of (Give In, Give In). However, it is possible for (Give In, Give In) to tie with (Demand, Give in) for first place. Some buyers may be equally happy with (Give In, Give In) because it also ensures that the sellers' information-processing practices are consistent with the buyer's requirements.

Now we turn to the remaining two options: (Give In, Demand) and (Demand, Demand). Both of these options certainly rank below the first two options, where the seller gives in, because the first two

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Vinod K. Aggarwal & Cédric Dupont, *Goods, Games, and Institutions*, 20 INT'L POL. SCI. REV. 393, 398-402 (1999).

options provide the buyer with the use of the website along with information processing consistent with the buyer's preferences, while neither of the two remaining options provides both. Buyers prefer (Give In, Demand) to (Demand, Demand) because the latter means the buyer is not allowed to use the site (although the seller also is not able to process the information). Buyers' behavior—entering billions of pay-with-data transactions daily with sellers who participate in the advertising ecosystem and give buyers no control over information processing—shows that buyers prefer to permit the information processing rather than forego use of the website.[63]

In summary, the buyer's preferences are: (Demand, Give In) either preferred to or tied with (Give In, Give In), which is preferred to (Give In, Demand), all of which are preferred to (Demand, Demand).

But what about buyers who are unaware of the advertising ecosystem and the information processing involved? We assume their preferences do not differ greatly from the buyers who are aware of the information processing, and hence that, if they realized their beliefs were mistaken, most of them would most likely join the ranks of the majority of buyers and continue to enter the same transactions. In this "if they were not mistaken" sense, we can say they too prefer to acquiesce to the current information-processing practices of sellers. Our answer is the same for those who think that "do not track" technologies curtail data collection. Cookie-blocking and other anti-tracking technologies are currently remarkably ineffective,[64] and we assume that if their users were to realize this, most of them would join the majority in acquiescing to data collection.

2. Sellers' Preferences

Sellers' preferences parallel those of "prefer collision second" Phoebe. First place goes to (Give In, Demand), which ensures that the buyers permit whatever information processing the seller desires. (Demand, Demand) occupies second place. Like "prefer collision second" Phoebe, sellers do not "swerve." Why? The question arises because sellers lose money when they refuse to accommodate the privacy preferences of "Demanders." However, sellers build buyer

63. *See* Kang, *supra* note 10, at 1218.

64. *See, e.g.*, Center for Digital Democracy Comments, *supra* note 13; Bil Corry & Andy Steingruebl, *Where is the Comprehensive Online Privacy Framework?* (W3C Workshop on Web Tracking and User Privacy, Position Paper, 2011), *available at* http://www.w3.org/2011/track-privacy/papers/Paypal.pdf; Vincent Toubiana & Helen Nissenbaum, *Content Based Do Not Track Mechanism* (W3C Workshop on Web Tracking and User Privacy, Position Paper, 2011), *available at* http://www.w3.org/2011/track-privacy/papers/Nissenbaum.pdf.

refusal into their information-processing practices.[65] The information processing involves standardized, automated routines designed to meet marketing goals, not to conform to buyers' varying privacy preferences.[66] A seller plays many—often millions—of games with buyers each day.[67] During any span of time, the seller believes enough buyers will give in to make one-size-fits-all information processing the profit-maximizing strategy. So in any particular game of Chicken, the seller's preference ranking is (Give In, Demand) and then (Demand, Demand).

We doubt that sellers have any clear preference between (Give In, Give In) and (Demand, Give In). Both options mean pursuing an information-processing policy consistent with a buyer's preferences, and both options are irrelevant to what sellers choose to do. Buyers will either "Demand" or "Give In," and in either case, sellers will opt for "Demand."[68]

3. One-Sided Chicken

Combine buyers' Phil-like preferences with sellers' collision-second Phoebe-like preferences, and you get a game of One-Sided Chicken[69] in which buyers always lose. This is not to claim that all buyers realize the situation they are in. Some buyers naively assume that the sellers' information processing is more or less in line with the buyers' privacy preferences.[70] Such buyers ignorantly acquiesce to information processing that is almost certainly

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65. *See Undermined Norms*, *supra* note 9, at 1074.

66. *See* Solove, *supra* note 17, at 1403-04.

67. A game theorist might expect that the repeated nature of these pay-with-data exchanges would necessitate the use of the theory of repeated games from game theory, rather than the stage games (i.e., one-shot games) we have been using here. *See, e.g.*, FINK ET AL., *supra* note 62, at 32-46; OSBORNE & RUBINSTEIN, *supra* note 12, at 133-36. However, because of the extremely simple structure of One-Sided Chicken and of its one equilibrium, there are no interesting features of repeated One-Sided Chicken that are not already present in the one-shot One-Sided Chicken we consider, so we can restrict our attention to the simpler case of the one-shot game. The same would *not* be true for classic Chicken. *See infra* text accompanying note 51.

68. We could put even fewer constraints on preferences, and we would still get the same result for One-Sided Chicken. As long as seller/Phoebe (1) prefers (Demand, Demand) to (Demand, Give In) and (2) prefers (Give In, Demand) to (Give In, Give In), then she has a "dominant strategy" and will always play Demand.

69. Another related model of website advertising as a game leads to the same (Give In, Demand) outcome: classic Chicken, but with the moves made sequentially rather than simultaneously, with Phoebe/seller making the first move. If in classic Chicken, *first* one player chooses a move, with the second player having complete information about which move was chosen, and *only then* the second player chooses his move, then the one equilibrium strategy is for the first player to Demand and the second to Give In. *See e.g.*, FINK ET AL, *supra* note 62, at 11-12.

70. *See* FTC STAFF REPORT, *supra* note 5, at 6.

inconsistent with their preferences; they give in without realizing it. Defense requires knowledge, but as soon as buyers acquire the requisite knowledge, they must lose the game. The knowledge reduces the buyer's options to two: (Give In, Demand) and (Demand, Demand). Since the buyer prefers the first option to the second, the buyer always gives in.

How do we escape One-Sided Chicken to enjoy appropriate informational norms? Chicken with cars contains a clue. In a 1950s B-grade Hollywood youth movie, Phil would introduce broken-hearted Phoebe to just-moved-to-town Tony. They would fall in love, and, in a key dramatic turning point, Phil and Phoebe would play Chicken. Phoebe would see that Tony is also in the car with Phil and would be the first to swerve. We need a "Tony" to change businesses' preferences. We contend that consumers would become the pay-with-data-exchange equivalent of Tony if they had close-to-perfect tracking-prevention technologies. Phoebe swerves because she does not want to lose her beloved Tony. Sellers are "in love" with advertising revenue. We argue that sellers will "swerve" to avoid losing the revenue they lose when buyers prevent data collection for advertising purposes, and we contend that, in a sufficiently competitive market, the result will be that an informational norm arises that implements a trade-off between informational privacy and competing concerns.

The first step is to introduce and explain norms.

III. NORMS, COORDINATION NORMS, INFORMATIONAL NORMS

We define norms in general first and then turn to the special case of coordination norms. Finally, we focus on the type of coordination norm that concerns us here: informational norms.[71]

A. Norms Generally

We define norms in terms of nearly complete conformity. A "norm" is a behavioral regularity in a group, where the regularity exists at least in part because almost everyone thinks that he ought to conform to the regularity.[72] We leave open the question of how many

71. We discuss these matters in detail in UNAUTHORIZED ACCESS, *supra* note 15. There are earlier discussions in Richard Warner & Robert H. Sloan, *Vulnerable Software: Product-Risk Norms and the Problem of Unauthorized Access*, 2012 U. ILL. J.L. TECH. & POL'Y 45; *The Undermining Impact of Information Processing*, *supra* note 15. In the text we offer a brief summary.

72. Our notion of a norm is a standard one in recent law and economics literature, with one exception. We explain conformity to the norm by appeal to people's beliefs above what they

must conform for almost everyone in a particular group to conform, as well as the question of how to define the group within which conformity occurs ("almost everyone" means "almost everyone in such-and-such group"). An example: In Jones's small town, everyone goes to a Protestant church on Sunday. They do so at least in part because each believes he or she ought to go.

B. Coordination Norms

Our primary concern is with coordination norms. A coordination norm is a behavioral regularity in a group, where the regularity exists at least in part because almost everyone thinks that, in order to realize a shared interest, she ought to conform to the regularity, as long as everyone else does.[73] The key difference from the Protestant church example is that there is a shared interest people can realize only through coordinated action. This is not true of the church example: people can attend church even if others do not. Driving on the right is a classic example. In the United States and other "drive on the right" countries, we drive on the right because, and only as long as, almost everyone else does so.[74] No one would drive on the right if she expected everybody else to drive on the left. Which side of the road one drives on depends on where one expects others to drive. However, everyone thinks that, for safety and convenience, all

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ought to do. The recent literature in contrast explains conformity as the result of self-interested actors avoiding the costs of nonconformity. "[One] approach typically assumes that people care only about their own (material) well being, and rely on repeated game models to explain how they cooperate or refrain from violating social norms. . . . [A] second approach typically assumes that people care about something else aside from material goods—esteem, or status, or conformity, or some such thing." Eric A. Posner, Introduction to SOCIAL NORMS, NONLEGAL SANCTIONS, AND THE LAW xi-xii (Eric A. Posner ed., 2007). Richard McAdams, a proponent of the second approach, notes that "by *norm* I mean a decentralized behavioral standard that individuals feel obligated to follow, and generally do follow . . . [to gain the esteem of others], *or* because the obligation is internalized, or both." Richard H. McAdams, *The Origin, Development, and Regulation of Norms*, *in* SOCIAL NORMS, NONLEGAL SANCTIONS, AND THE LAW 101, 144 (Eric A. Posner ed., 2007). The emphasis on "feeling obligated" would appear close to our view that people conform because they think they ought to; however, McAdams explains "feeling obligated" in terms of the costs of non-conformity—thus: "Without internalization, one obeys the norm to avoid external sanctions. . . . After internalization, there is yet another cost to violating a norm: guilt. The individual feels psychological discomfort whether or not others detect her violation." *Id.* McAdams still conceives of people as self-interested agents seeking to avoid costs they regard as unacceptable. We take it to be clear that people are not merely self-interested agents. The assumption that they are has been extensively and decisively criticized. *See, e.g.*, AMARTYA SEN, THE IDEA OF JUSTICE 32-33 (2009).

73. *See Undermined Norms*, *supra* note 9, at 1060.

74. H. Peyton Young, *The Economics of Convention*, 10 J. ECON. PERSP. 105, 107-08 (1996) (providing a game-theoretic explanation of the decision made by individual drivers as to whether to drive on the right or left side of the road).

drivers should drive on the same side. One cannot achieve this goal alone; one needs the cooperation of others.

Similarly, in elevator etiquette, the norm is to maximize the distance to your nearest neighbor.[75] The norm balances two competing interests: using the elevator when it arrives, and avoiding overcrowding. All share an interest in being able to use the elevator and avoiding overcrowding, and no one can realize the interest unilaterally. We think we ought to conform to achieve this balance—as long as everyone else does so. There is little point in being a "nearest-neighbor distance maximizer" if everyone else just stands wherever they like.

In both examples, everyone conforms to the regularity (driving on the right, maximizing distance from the nearest neighbor) because everyone thinks that, to realize the shared interest, he or she ought to conform, as long as everyone else does. We define coordination norms with reference to this "shared interest/ought to conform, as long as everyone else does" pattern. The "ought" is conditioned on the assumption about everyone else. We will need to refer to such "oughts" frequently, and, to avoid constant repetitions of "as long as everyone else does," we will say, for short, that one thinks one *ought conditionally* to conform.[76]

We focus on the role of coordination norms in mass markets. In mass markets, coordination norms shape *buyers'* demands. A mass-market buyer cannot unilaterally ensure that sellers will conform to his or her requirements; coordination norms create collective demands to which profit-motive-driven sellers respond. One key question: Who are the parties subject to demand-unifying norms in mass markets? The answer may at first seem obvious: buyers and sellers. After all, they need to coordinate so that sellers supply what buyers demand; and, if the norms are to allocate risks between buyers and sellers, how could both not be parties to the norm? However, while it is possible to model mass-market demand-unifying norms as

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75. This is a simplification. The true norm is closer to "maximize the distance from your nearest neighbor subject to the constraint that you stay within the peripheral vision of at least one other passenger, and that you have at least one other passenger within your peripheral vision." *See generally Where we stand in an elevator*, YOU THE USER (Apr. 26 2012), http://youtheuser.com/2012/04/26/where-we-stand-in-an-elevator.

76. Our notion shares similarities with the notion proposed in STEVEN A. HETCHER, NORMS IN A WIRED WORLD (2004). There are also important affinities between our notion of a coordination norm and the notion of a coordination game. The original idea of coordination games and the term "coordination game" comes from DAVID K. LEWIS, CONVENTION: A PHILOSOPHICAL STUDY (1969); Lewis's notion of a convention, in turn, is inspired by THOMAS C. SCHELLING, THE STRATEGY OF CONFLICT (1960). For a more recent treatment, see RUSSELL W. COOPER, COORDINATION GAMES: COMPLEMENTARITIES AND MACROECONOMICS (1999).

buyer-seller coordination norms,[77] it is simpler and more elegant to model them as norms to which the only parties are buyers. The key point is that producers design and sell mass-market products in response to sufficiently large groups of buyers. Hence, no mass-market buyer can unilaterally ensure, for example, that his desired level of privacy will be available; only a sufficiently large collective demand can accomplish that. Coordination via demand-unifying norms creates the required collective demand, to which profit-motive-driven sellers respond. Since the profit motive is sufficient to ensure that sellers respond, there is no need to see the sellers as a party to the coordination norm. Demand-unifying norms take the following form: "buyers demand that sellers . . . ." The reference to sellers may suggest, contrary to what we said earlier, that both buyers and sellers are parties to the norm. This is a misimpression. Buyers are the only parties subject to the norm. The norm coordinates their demands, and sellers respond—not because they are parties to the norm, but because they want to profit by meeting the unified demand.[78]

C. Informational Norms

The informational norms with which we are concerned are coordination norms that govern the collection, use, and distribution of information.[79] As Helen Nissenbaum notes, informational norms

> [g]enerally . . . circumscribe the type or nature of information about various individuals that, within a given context, is allowable, expected, or even demanded to be revealed. In medical contexts, it is appropriate to share details of our physical condition or, more specifically, the patient shares information about his or her physical condition with the physician but not vice versa; among friends we may pour over romantic entanglements (our own and those of others); to the bank or our creditors, we reveal financial information; with our professors, we discuss our own grades; at work, it is appropriate to discuss work-related goals and the details and quality of performance.[80]

In commercial contexts, informational norms are generally instances of the following pattern: buyers demand that the seller collect, use, and distribute information only as is appropriate for that

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77. *But see supra* text accompanying note 60.

78. Helen Nissenbaum, *Privacy as Contextual Integrity*, 79 WASH. L. REV. 119, 120-21 (2004).

79. Not all informational norms are coordination norms. For example, our norm-generation process under conditions of perfect competition produces an informational norm that is not a coordination norm. *See infra* Part IV.B. It is only in real markets that the process produces a coordination norm. *See infra* Part V.B. However, since real markets are our ultimate concern, the informational norms that primarily concern us are coordination norms.

80. Nissenbaum, *supra* note 78, at 138.

seller's role.[81] The shared interest is that businesses confine themselves to role-appropriate processing.[82] Relying on the work of Nissenbaum and others, we assume that transactions between consumers and businesses occur against a background of informational norms.[83] An example is in order, however.

Imagine Vicki is shopping in a wine store. The relevant norm is that the store may process information only in ways appropriately related to the store's role as a retailer of wine. This norm strikes a balance between privacy and the ends served by information processing by only permitting the processing of some information and only for certain purposes. Vicki cannot implement this balance on her own. A mass-market buyer cannot unilaterally ensure that sellers will conform to the buyer's requirements; coordination norms create collective demands to which profit-motive-driven sellers respond.[84] Informational norms—like coordination norms generally—play a key role in mass markets by unifying buyers' demands to the point that mass-market sellers will meet those demands.[85] For example, it is currently a norm that buyers demand personal computers with a

81. "Role-appropriateness" is determined contextually. Over a wide range of cases, group members share a complex set of values that leads them to more or less agree in their particular contextual judgments of appropriateness. "Within each context, the relevant *agents*, the *types of information*, and *transmissions principles* combine to shape the governing informational norms." Michael Zimmer, *Privacy on Planet Google: Using the Theory of "Contextual Integrity" to Clarify the Privacy Threats of Google's Quest for the Perfect Search Engine*, 3 J. BUS. & TECH. L. 109, 115 (2008). Norms vary from group to group. For simplicity, however, we take the relevant group to be all US consumers.

82. This interest in sticking to role-appropriate processing is shared only among buyers, not buyers and sellers; as we emphasized earlier, our mass-market coordination norms are *buyer-only* norms. *See supra* Part III.B. This is one reason to choose a buyers-only approach to modeling mass-market coordination norms. We could still model the norms as having buyers and sellers as parties and make the point about buyers sharing an interest in only role-appropriate information processing, but the price would be considerable complication.

83. For a small sample of this diverse literature, see PIERRE BOURDIEU & LOÏC J.D. WACQUANT, AN INVITATION TO REFLEXIVE SOCIOLOGY (1992); MICHAEL PHILIPS, BETWEEN UNIVERSALISM AND SKEPTICISM: ETHICS AS SOCIAL ARTIFACT (1994); MICHAEL WALZER, SPHERES OF JUSTICE: A DEFENSE OF PLURALISM AND EQUALITY (1983); Julie E. Cohen, *Examined Lives: Informational Privacy and the Subject as Object*, 52 STAN. L. REV. 1373 (2000); Roger Friedland & Robert R. Alford, *Bringing Society Back In: Symbols, Practices, and Institutional Contradictions*, *in* THE NEW INSTITUTIONALISM IN ORGANIZATIONAL ANALYSIS 232 (Walter W. Powell & Paul J. DiMaggio eds., 1991); Helen Nissenbaum, *Protecting Privacy in an Information Age: The Problem of Privacy in Public*, 17 LAW & PHIL. 559 (1998); James Rachels, *Why Privacy is Important*, 4 PHIL. & PUB. AFF. 323 (1975); Paul M. Schwartz, *Privacy and Democracy in Cyberspace*, 52 VAND. L. REV. 1609 (1999); Jeroen van den Hoven, *Privacy and the Varieties of Informational Wrongdoing*, *in* READINGS IN CYBER ETHICS 430 (Richard A. Spinello & Herman T. Tavani eds., 2001).

84. *See supra* note 78 and accompanying text.

85. *See supra* notes 86-91 and accompanying text; *infra* notes 86-100 and accompanying text.

graphical interface.[86] However, if almost all buyers demanded a UNIX command line interface, mass-market sellers would meet that demand and ignore the few buyers that want a graphical interface.[87]

D. Value-Optimal Norms

A cornerstone of our analysis is that coordination norms—and hence informational norms—may or may not be value-optimal. A coordination norm is value-optimal when, in light of the values of all (or almost all) members of the group in which the norm obtains, the norm is at least as well justified as any alternative.[88] A norm that is at least as well justified as any alternative is either better justified than any alternative or is tied with one or more alternatives that are also better than the rest. This is why it is appropriate to call a norm "value-*optimal*" when it is at least as well justified as any alternative: there is no better alternative.[89] There are many optimality notions; Pareto optimality is perhaps the most well known.[90] Value-optimality is the notion for our purposes. A terminological point: In the informational-privacy context, we will broaden our use of "value-optimal" to apply both to informational norms and to trade-offs between privacy and competing goals. A trade-off is value-optimal when it is at least as well justified as any alternative.

As we argue below, when value-optimal informational norms govern mass-market transactions, buyers give free and informed consent to acceptable trade-offs between informational privacy and competing concerns.[91] The concern here is that, in a number of important cases, rapid advances in information-processing technology have outstripped the relatively slow evolution of norms and created novel situations for which we lack relevant value-optimal

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86. *See* Jeremy Reimer, *A History of the GUI*, ARS TECHNICA (May 5, 2005, 1:40 AM), http://arstechnica.com/features/2005/05/gui ("It is pretty much assumed whenever anyone sits down to use a personal computer that it will operate with a graphical user interface. We expect to interact with it primarily using a mouse, launch programs by clicking on icons, and manipulate various windows on the screen using graphical controls. But this was not always the case.").

87. *See supra* text accompanying notes 84-98.

88. To avoid misunderstanding, we should note that we are not, for example, saying that when you step into an elevator, you explicitly think about where you ought to stand. Typically, people just unreflectively conform to the norm. The point is that you could justify conformity if you reflected on the norm under ideal conditions (including having sufficient time, sufficient information, lack of bias, and so on).

89. *See supra* note 88 and accompanying text; *infra* notes 90-104 and accompanying text.

90. A situation is Pareto optimal when, and only when, it is not possible to improve the well-being of any one person without making others worse off.

91. *See infra* Part III.E-F.

informational norms. There are two ways in which value-optimal norms may be lacking: (1) relevant norms exist, but they are not value-optimal; or (2) relevant norms do not exist at all. The consequence is the same in each situation: we lack any effective mechanism to give free and informed consent. Instead, we submit to poor trade-offs between privacy and competing goals. Behavioral advertising is an instance of the second type of case; they lack the relevant norms altogether. We have discussed the "norms but not value-optimal" cases in detail elsewhere.[92]

Before we turn to the lack of norms for behavioral advertising, it is important to understand what buyers are missing when the transactions they enter are not governed by value-optimal norms. Accordingly, we first explain how value-optimal informational norms ensure free and informed consent to acceptable trade-offs.

E. Norms and Consent

We need to answer three questions about exchanges governed by value-optimal informational norms: (1) Why are the trade-offs the norms implement acceptable to buyers? (2) In what sense is consent to the trade-offs "informed"? And, (3) in what sense is consent "free"? The first question is easy to answer. Information processing consistent with a value-optimal norm implements a trade-off that is acceptable in the sense that it is justified by buyers' values, and there is no alternative that is better justified. The answer to the second question requires a bit more elaboration.

A natural first response is that informed consent requires awareness of the ways in which the information will be used. This will not do, however. Current information-processing practices store data for very long times for later use in ways that are unpredictable at the time a buyer consents to the data collection.[93] Therefore, the buyer's consent cannot be informed if being informed means being

92. An example of a norm that is not value-optimal is the "no helmet" norm among pre-1979 National Hockey League players. Thomas C. Schelling, *Hockey Helmets, Concealed Weapons, and Daylight Saving: A Study of Binary Choices with Externalities*, 17 J. CONFLICT RESOL. 381, 381 (1973). In 1979, the League mandated wearing helmets. *Id.* Prior to that time, not wearing a helmet was a behavioral regularity that existed in part because each player thought he ought to conform, as long as all the others did—primarily to appear tough, and secondarily to have slightly better peripheral vision. *Id.* However, because of the value they placed on avoiding head injuries, virtually all the players regarded the alternative in which they all wore helmets as better justified. *Id.* However, they remained trapped in the suboptimal norm. *Id.* We argued elsewhere that the same happens with informational privacy. *Id.* Our most recent and complete argument is in UNAUTHORIZED ACCESS, *supra* note 15. An earlier, shorter argument is in *Undermining Impact of Information Processing*, *supra* note 15.

93. *See* Solove, *supra* note 17.

aware of how the data will be used. The options are either to conclude that consent cannot be informed or to seek another understanding of what it means for consent to be informed. We choose the latter course. We will regard consent as informed *provided the buyer knows that the consent is to practices governed by a value-optimal norm.* To know that the practices are governed by a value-optimal norm is to know that norm-consistent uses of the buyer's information—both uses now and uses, whatever they may be, in the unpredictable future—will implement trade-offs between privacy and competing goals that are, in light of the buyer's values, at least as well justified as any alternative.

Explaining why consent counts as free is more problematic than explaining why it counts as informed. Consider Vicki. As a practical matter, she cannot avoid consenting to the norm-imposed trade-off. Of course, she could simply not buy wine at all, but she enjoys wine and is not willing to give it up, nor is she willing to spend time and effort investigating the exact information-processing practices of the local wine stores. She is already committed to a variety of goals—raising her children, pursuing her career, enjoying her friends, and so on—and the time she is willing to allot to buying wine is relatively brief. Acquiescing to norm-permitted information processing is her only viable option. So how can her consent be free?

Are constrained choices after all the example *par excellence* of unfree choices? When a thief, with a gun to your head, demands, "Your money or your life!" the thief violates your freedom by compelling your choice. The only meaningful option is to hand over your money. There is no gun to the head in informational-norm-governed transactions, but options are, in practice, typically reduced to one—conform to the norm. Does the lack of options not entail a lack of freedom?

The answer lies in the fact that even a highly constrained choice can still be a free choice. Imagine, for example, that you have your heart set on a vacation in the Cayman Islands; unfortunately, your tight budget appears to make the trip impossible. Your solution is to constrain your choices by opting for an "all inclusive" vacation package that offers airfare, hotel, and food for a single affordable price. In doing so, you *voluntarily* constrain your food options in order to *freely* realize your vacation goal, and, when you eat the hotel food, you do so as an essential means to realizing your vacation goal and hence as something fully justified in light of your values. Your constrained choice is free in the sense that it is a fully justified component of a freely chosen overall plan. Contrast the thief example. Giving the money to the thief is not a fully justified part of your overall plan; it is an unjustified interference with it.

Similar analysis holds for Vicki's wine-store transaction. She allots only a relatively small amount of time to purchasing wine. She wants to purchase suitable wine within that time and return to pursuing her other goals. She knows the store will process some range of personal information, and she wants an acceptable trade-off between her informational privacy and the various interests served by processing the information. The wine-store norm—processing personal information only in ways appropriately related to the store's role as a seller of wine—offers her a ready-made trade-off, and, as long as the norm is value-optimal, the trade-off is not only justified in light of her values, but there is also no alternative that is better justified.

We conclude that, when buyers conform to value-optimal norms, buyers give free and informed consent to the norm-implemented trade-offs. When we take value-optimal norms away from mass-market buyer/seller exchanges, we lose the background that ensures free and informed consent to acceptable trade-offs. The problem that concerns us is that relevant value-optimal coordination norms do not exist for pay-with-data exchanges. We first argue that the norms do not exist, and we then turn to explaining how to create the necessary value-optimal norms.

F. Lack of Norms for Pay-With-Data Exchanges

The argument that pay-with-data exchanges lack norms turns on the definition of coordination norms as regularities to which the parties to the norm coordinate to realize a shared interest.[94] The shared interest in the case of informational norms is that sellers limit themselves to role-appropriate information processing.[95] We claim that relevant informational norms do not exist for pay-with-data exchanges because we lack widely shared notions of role-appropriate information processing for such exchanges. An analogy shows why.

Suppose that, unbeknownst to each other, two long-time friends have become expert chess players. When they begin to play friendly games together, they at first have no norms that govern how they will use their chess-playing powers against each other. How should they deal with victory and defeat? Should the victor be reassuring or taunting? In a losing position, how long should one struggle hoping for an error before acknowledging defeat and resigning? They lack shared conceptions of role-appropriate behavior as chess players. As they play, those conceptions and the associated

94. *See supra* Part III.B.

95. *See supra* Part III.B.

coordination norms develop, but they do not exist at first. They arise over time out of repeated interactions.

We are in a similar situation with pay-with-data exchanges. The newly acquired power is the vastly increased ability to process information, and we lack relevant shared conceptions of role-appropriateness. These conceptions will only evolve over time through patterns of social and commercial interaction. Instead of shared conceptions of appropriateness, we have the intense controversy that surrounds behavioral advertising today. As we noted earlier, buyers are willing to trade some privacy for some of the advantages of permitting extensive information processing, but buyers want a better trade-off than the one the advertising ecosystem currently imposes on them.[96] Any adequate response to behavioral advertising must strike the proper balance, and as James Rule notes, "We cannot hope to answer [complex balancing questions] until we have a way of ascribing weights to the things being balanced. And that is exactly where parties to privacy debates are most dramatically at odds."[97] We lack shared conceptions of role-appropriate information processing in many cases, but in particular in pay-with-data exchanges.

IV. NORM CREATION IN CONDITIONS OF PERFECT COMPETITION

We explain how to create desired norms by first explaining how to create them under ideal conditions and then explaining how to approximate the ideal conditions in practice. The ideal conditions in this case are the conditions of perfect competition. We choose perfect competition as the ideal because our focus is on the incentive-shaping effect of coordination norms in mass markets.

A. Perfect Competition

We define competition as perfect when, and only when, six conditions exist:[98]

1. *Profit-motive-driven sellers.* Businesses seek to maximize profit.[99]

96. *See supra* notes 6-7 and accompanying text.

97. JAMES B. RULE, PRIVACY IN PERIL 183 (2007).

98. Our definition follows a standard pattern. *See e.g.*, WALTER NICHOLSON & CHRISTOPHER SNYDER, MICROECONOMIC THEORY: BASIC PRINCIPLES AND EXTENSIONS 415 (2012).

99. *See* Scott A. Beaulier & Wm. Stewart Mounts, Jr., *Asymmetric Information about Perfect Competition: The Treatment of Perfect Information in Introductory Economics Textbooks*,

2. *Lack of market power.* Neither sellers nor buyers can individually control the price or determine the features of a product or service.[100]
3. *Homogeneous products and services.* The products and services involved in pay-with-data exchanges are quite diverse, but the homogeneity that matters for us is that they are all pay-with-data exchanges. The relevant similarity is in the mechanism of the sale, not the items sold. The argument we offer works for all pay-with-data exchanges, no matter what is exchanged, so our references below to "products and services" are to any particular product or service involved in a pay-with-data exchange.[101]
4. *No barriers to entry and exit.* Competitors may costlessly enter and leave the market, and buyers can costlessly switch from one seller to another.[102]
5. *Zero transaction costs.* Buyers and sellers incur no costs in carrying out exchanges.[103]
6. *Perfect information.* The perfect information requirement takes various forms.[104] Minimally, buyers and sellers know all prices. Most generally, all buyers and sellers are assumed to know everything relevant to their own production and consumption decisions.[105] We will use this broader understanding. For pay-with-data exchanges, we assume the following: (1) If there is at least one value-optimal trade-off between the benefits of information processing and informational privacy, then buyers know what that trade-off is (and they will prefer it); (2) Buyers know whether or not a seller's information-processing practices are consistent with that trade-off; (3) Sellers know that buyers prefer that trade-off, and they know that buyers have the knowledge specified in (2).

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in EXPANDING TEACHING AND LEARNING HORIZONS IN HIGHER EDUCATION: ESSAYS ON ECONOMIC EDUCATION (Franklin G. Mixon, Jr. & Richard J. Cebula eds., 2009).

100. Definitions often substitute the requirement that there be a large number of sellers and buyers; the point, however, is to make the size of the market sufficient to ensure that no one seller or buyer has the power to set prices and determine features.

101. *See* Beaulier & Mounts, *supra* note 99, at 211.

102. *See id.* at 209.

103. *See* NICHOLSON & SNYDER, *supra* note 98, at 415.

104. Some definitions of perfect competition omit any mention of perfect information. *See* Beaulier & Mounts, *supra* note 99. We include perfect information in our definition because appeals to perfect information (and real world approximations to it) play a central explanatory role for us.

105. *See* Beaulier & Mounts, *supra* note 99.

B. Norm Creation in Perfectly Competitive Markets with a Value-Optimal Trade-Off

We assume that buyers and sellers initially play a "seller wins" game of One-Sided Chicken. We assume also the existence of at least one value-optimal trade-off between the benefits of information processing and information privacy.[106] To see how, under these conditions, a norm among buyers arises, and also how the game between buyers and sellers changes, consider first that the "[n]o barriers to entry and exit" assumption ensures that buyers can, at no cost, switch to sellers who offer the value-optimal trade-off that buyers prefer. Our perfect-information assumptions guarantee that buyers can identify the sellers who offer that trade-off. Since buyers prefer that trade-off, and can identify the sellers who offer it, they will buy from those sellers—if such sellers exist.[107] And those sellers will exist, as the following considerations show. Sellers know what trade-offs buyers prefer, and they know that buyers can tell if they offer those trade-offs. Hence, sellers know that the best profit-maximizing strategy is to offer that trade-off. It follows that the sellers will adopt this strategy (since we assume that they are profit-motive driven). Sellers will offer the value-optimal trade-off even if they initially did not do so. The absence of transaction costs and barriers to entry and exit guarantees that modifying the seller's information processing is costless, and the lack of market power guarantees that no one can prevent a seller from beginning to offer the trade-off. Eventually, all sellers will offer the value-optimal trade-off. The result is that buyers and sellers are no longer locked in a game of One-Sided Chicken. Both end up preferring as their first choice the value-optimal trade-off.

The consequence is that the "buyers demand the value-optimal trade-off" norm will become a behavioral regularity to which buyers conform because they think they ought to. Indeed, our assumptions are so strong that demanding the value-optimal trade-off is a norm, but *not* a coordination norm; buyers think they ought to demand the

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106. Such a trade-off does not have to exist. It could also be the case that every individual finds a different trade-off to be the one most in accord with his or her values. Another possibility is that our values may not pick out an alternative that is at least as well justified as any alternative. Our evaluative perspectives may sometimes fail to provide complete maps that guide us through the decisions we must make; they may be sketches leaving large areas barely filled in, if filled in at all. *See, e.g.*, AMARTYA SEN, *supra* note 72. No value-optimal trade-off is one possibility; multiple such trade-offs is another. For example, everybody might find Information Processing Policy A coupled with free use of the *New York Times*'s website and Information Processing Policy B together with a requirement to pay a particular price for use of the *New York Times*'s website to be equally well justified in light of their values, and both at least as good as any other alternative.

107. *See supra* note 57 and accompanying text.

value-optimal trade-off between information processing and other competing interests independently of other buyers' behavior. It may seem we have departed from our general form for informational norms: "buyers demand that sellers process information only in role-appropriate ways." However, if a seller, in response to buyer demand, processes information in the buyer-demanded value-optimal ways, that seller certainly does so to process the information in accord with a shared conception of role-appropriateness.[108]

V. NORM CREATION IN REAL MARKETS

We can replicate these results in real markets to the extent real markets sufficiently approximate the conditions of perfect competition. This Article assumes that the markets sufficiently approximate all of the conditions except for the perfect-knowledge condition. This is by no means to suggest that the other assumptions are not problematic. They certainly are, but that is a different problem requiring analysis in the context of competition and antitrust law. We focus on approximating the perfect information assumption, and we begin with the obstacles in the way of any approximation.

In the "perfect-markets" argument, we specified the relevant knowledge by assuming the existence of a value-optimal trade-off between the benefits of information processing and informational privacy. We assumed that buyers knew which trade-off that was and whether a seller offered that trade-off. None of this is true in practice. To begin with, people do not yet agree on what trade-offs are best justified. Reaching agreement on this is not like finding buried treasure. The buried treasure is there whether we find it or not, but the answers we need about value-optimal trade-offs are not similarly buried in our values just waiting for us to think long enough and hard enough to find them. We need to invent them. Our values are not closed, complete, consistent systems that guide us through the decisions we must make. Our values are more or less detailed outlines that may leave large areas barely filled in, and they often incorporate competing, or outright inconsistent, claims and views, whose weight is not fixed in advance of our reasoning about the situations in which we find ourselves. We often need to extend our values to cover new situations, and rapid advances in information-processing technology require us to do so now for website advertising.

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108. We can infer role-appropriateness from value-optimality, but the inference does not work the other way around. Informational norms that are not value-optimal are examples of role-appropriate information processing that is not value optimal. We discuss such examples in *The Undermining Impact of Information Processing*, *supra* note 15 and UNAUTHORIZED ACCESS, *supra* note 15.

To make matters more difficult, merely creating agreement on a trade-off may not be enough to solve the problem. Contrary to what we assumed in the case of perfect competition, buyers knowing what the trade-off is may not be enough to guarantee that buyers demand that sellers make that trade-off available to them. The reason is that advertisers are a significant source of revenue for sellers in markets in which buyers provide information and receive advertising in exchange for products and services.[109] As long as buyers are trapped in "seller wins" One-Sided Chicken, large and stable advertising revenues will make sellers unresponsive to demands from small minorities of buyers to change the sellers' information-processing policies.

In the hypothetical ideal "perfect competition" market, some seller would meet the information-processing demands of even a small minority of buyers, because that seller could increase profit by doing so. However, in the real world, websites such as Facebook, Google, and the half dozen largest news sites all have great market power, and any would-be new competitor faces significant barriers to entry.[110] Furthermore, if only a small number of buyers have different information-processing demands, then the transaction costs of identifying those buyers might be too great to make it worthwhile to meet the privacy demands of those buyers.

So, in real markets, even if buyers agree on a value-optimal trade-off, buyers who want use of such websites will still prefer to acquiesce to sellers' information-processing practices unless the group of buyers refusing to do business without a change in those practices is large enough to compel the seller to alter its practices. The group of buyers would need to be large enough that the lost business significantly reduces advertising revenue. This was not a concern in perfectly competitive markets because *every* buyer switches to sellers offering the value-optimal trade-off.

A. A Norm-Generation Process

Our solution assumes that every buyer possesses close-to-perfect "do not track" technologies. A tracking-prevention technology would be perfect if it were completely effective in blocking information processing for advertising purposes, completely

109. Typical sellers we have in mind are websites such as CNN, Yahoo!, and Craigslist. *See* CNN, http://www.cnn.com (last visited Sept. 12, 2012); YAHOO!, http://www.yahoo.com (last visited Sept. 12, 2012); CRAIGSLIST, http://www.craigslist.org (last visited Sept. 12, 2012).

110. In fact, the game in the hypothetical world of perfectly competitive markets was not strictly speaking One-Sided Chicken. One-Sided Chicken is a one-buyer-versus-one-seller game, but in perfectly competitive markets a buyer plays against a multitude of sellers, all lacking market power.

transparent in its effect, effortless to use, and it permitted a user full use of any website.

We begin with a summary of our proposed norm-generation process: (1) buyers will use the "do not track" technologies; (2) use of these technologies will threaten sellers with a dramatic decline in advertising revenue; (3) sellers will respond by offering buyers information processing consistent with their preferences; and (4) the ultimate result will be a collection of value-optimal norms governing pay-with-data transactions.

1. Buyers Will Use the Technologies

As we noted at the beginning, the vast majority of buyers wants greater control over their information than current information-processing practices allow. We assume that the desire for control is sufficiently strong that buyers would block tracking if they had close-to-perfect tracking-prevention technologies. If this turns out not to be true, it would certainly be necessary to reevaluate the surveys that report buyers' strong objections to current behavioral advertising.[111]

2. Advertising Revenue Will Decline

The result of buyers using close-to-perfect do-not-track technologies used is a loss of advertising revenue for sellers. Sellers' advertising revenue is a function of the number of advertisements on their websites and the number of responses to them.[112] The attractiveness of a website as an advertising platform depends on the effectiveness of advertisements on that website.[113] In the online advertising ecosystem, this effectiveness is a function of the amount and accuracy of the information collected from the site about buyers.[114] When all buyers block the collection of such information, the effectiveness of advertisements declines, and websites lose a good

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111. *See supra* note 10.

112. *See* Omer Tene, *Privacy: The New Generations*, 1 INT'L DATA PRIVACY L. 15, 16-17 (2010), *available at* http://idpl.oxfordjournals.org/content/1/1/15.full; *see also* AdWords Help: Cost-per-click Bidding, GOOGLE, http://support.google.com/adwords/bin/answer.py?hl=en&answer=2459326 (last updated Sept. 17, 2012) (discussing the per-click, per-view, and per-conversion advertisement-bidding processes for the placement of ads on Google's search result pages, blogs, and ad network).

113. *See* Tene, *supra* note 112, at 16-17.

114. *See* Omer Tene & Jules Polonetsky, *To Track or "Do Not Track": Advancing Transparency and Individual Control in Online Behavioral Advertising*, 13 MINN. J. L. SCI. & TECH. 281, 283; FTC STAFF REPORT, *supra* note 5, at 2; Tene, *supra* note 112, at 16-17.

deal of their attractiveness as advertising platforms.[115] Advertisers are more likely to spend their advertising budgets elsewhere—on TV, radio, and print-publication advertisements. Thus, it does not matter that advertisers are a significant source of revenue. Websites lose that revenue when they lose their attractiveness as advertising platforms.

3. Sellers Will Conform More Closely to Buyers' Preferences

Sellers will respond by offering information processing consistent with buyers' preferences. They will, that is, if they can segment buyers into groups of shared preferences, and if at least some of the groups are sufficiently large that the expected profit from meeting those groups' preferences is greater than the cost of not doing so. We fully expect buyers to cluster into such groups. Even if they do not initially, sellers will be able to form such groups of buyers through advertising. Advertising can powerfully shape buyers' demands. Direct-to-consumer advertising of prescription drugs is an excellent example; it has increased the demand for such drugs.[116] Website use is similar. Accessing websites for all sorts of purposes is now such an entrenched feature of daily life that not doing so is no longer an option. Accessing websites has a "side effect," however—the collection and commercialization of information about buyers. Advertising that promotes trade-offs between the benefits and the "side effect" should coalesce buyer demand more or less as well as prescription-drug advertising. So sellers will conform to buyers' preferences by shaping those preferences in ways that make conformity profitable. Like Phoebe when she sees Tony in the car, sellers will "swerve" to avoid losing the advertising revenue that they "love."

We contend that a collection of norms will arise as a result. This final conclusion, contemplating whether those norms are truly value-optimal, merits a separate subsection.

B. Norms? Yes. Value-Optimal? Yes, But . . .

The result of the process outlined above will be a number of behavioral regularities of the form, "buyers demand such-and-such trade-off." Eventually, not only will the trade-offs be value-optimal, but buyers will also believe they are. Recall that consumers are currently not even close to consensus about how to strike a

115. *Cf.* Ira S. Rubinstein, *Regulating Privacy by Design*, 26 BERKELEY TECH. L.J. 1409, 1440 (2011).

116. Meredith B. Rosenthal et al., *Demand Effects of Recent Changes in Prescription Drug Promotion*, 6 FRONTIERS HEALTH POL'Y RES. 1 (2003).

value-optimal trade-off between privacy and the benefits of information processing. As advertising unites buyer demand into suitably sized groups, buyers will continue to engage in billions of pay-with-data exchanges daily. Over time, the trade-offs implemented in the exchanges will cease to be merely accepted; they will become acceptable. Buyers will ultimately recognize the trade-offs as value-optimal. Buyers' values will have evolved and transformed so that they regard the trade-offs as at least as well justified as any alternative. At that point, the regularities will be coordination norms. Buyers will conform to the regularity because we think we ought to (our values dictate that we ought), and the "ought" will be conditional. A buyer thinks she ought to conform only as long as almost all others do; if almost all others demanded some other trade-off, the buyer would think she ought conditionally to do so, too. Sellers would not meet an idiosyncratic demand, so, as long as foregoing the services is not an acceptable option, the buyer will think she ought to demand the trade-off conditionally.[117]

So is this not what was wanted? A way out of One-Sided Chicken that yields value-optimal norms? That depends. We (the authors) have no doubt that the process will lead to value-optimal norms, but will it be a process that as a society we will later regret? What one values in one's youth, as a result of a personality-shaping factor, one may regret when one is older. The same may happen society-wide. It is possible, for example, that the process leads to the world Daniel Solove dreads, the world in which a permanent, ever-growing, readily searchable trail of information records the trivial to the intimate to the unfortunate details of our lives from childhood onward.[118] How can we avoid such regrettable outcomes?

Our suggestion is to rely on consumer educational initiatives.[119] They can powerfully shape buyers' preferences. For example, the spread of health information has led, over the last twenty years, to a per capita increase in poultry consumption at the expense of beef consumption.[120] The explanation presumably is that education altered

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117. Buyers may divide into several groups each with a different opinion about what trade-off is value-optimal. As long as the groups are large enough (and sellers can identify who belongs to which group), different coordination norms may arise for each group.

118. DANIEL J. SOLOVE, THE FUTURE OF REPUTATION: GOSSIP, RUMOR, AND PRIVACY ON THE INTERNET 17 (2007).

119. The Federal Trade Commission's efforts illustrate the type of educational initiatives we have in mind. Since the rise of e-commerce in 1995, "the Commission has conducted a series of public workshops and has issued reports focusing on online data collection practices, industry's self-regulatory efforts, and technological efforts to enhance consumer privacy." FTC STAFF REPORT, *supra* note 5.

120. Henry W. Kinnucan et al., *Effects of Health Information and Generic Advertising on U.S. Meat Demand*, 79 AM. J. AGRIC. ECON. 13 (1997).

the values about health and enjoyment that guide people's food choices.[121] Our hope is that consumer education will direct value formation away from regrettable paths.

VI. PROSPECTS FOR "DO NOT TRACK" TECHNOLOGIES

Our norm-generation argument assumes close-to-perfect tracking-prevention technologies. Current technologies are very far from perfect. They are remarkably ineffective, not at all transparent in effect, daunting for average buyers to use, and may interfere with the use of websites.[122] What are the prospects for developing close-to-perfect technologies? They are not unpromising. At the 2011 W3C Web Tracking and User Privacy Workshop, representatives from BlueKai,[123] Datran Media,[124] Intel,[125] and Microsoft,[126] not only expressed their willingness to incorporate emerging "do not track" technologies, they emphasized the importance of doing so. Considerable controversy remains, however, over what the technologies should do and how they should do it.[127]

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121. *See id.* at 20 ("That health concerns may play an important role in explaining meat consumption patterns is suggested by the magnitude of the estimated health information elasticities of . . . poultry and . . . beef[, which] hint at the potential importance of health information in explaining increases in poultry consumption and declines in beef consumption over time.").

122. *See* Mika Ayenson et al., *Flash Cookies and Privacy II: Now with HTML5 and ETag Respawning* (Working Paper, 2011), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1898390; German Gomez et al., *Cookie Blocking and Privacy: First Parties Remain a Risk*, TRUST (2010), http://www.truststc.org/reu/10/Reports/GomezG,YalajuJ_paper.pdf; Balachander Krishnamurthy et al., *Privacy Leakage vs. Protection Measures: The Growing Disconnect*, http://www2.research.att.com/~bala/papers/w2sp11.pdf; Ryan Singel, *Researchers Expose Cunning Online Tracking Service That Can't Be Dodged*, WIRED (July 29, 2011, 6:24 PM), http://www.wired.com/epicenter/2011/07/undeletable-cookie.

123. Letter from Omar Tawakol, Chief Exec. Officer, BlueKai, to Lorrie F. Cranor & Thomas Roessler, World Wide Web Consortium (Mar. 25, 2011), *available at* http://www.w3.org/2011/track-privacy/papers/BlueKai.pdf (presenting "Proposal for Browser Based Do-Not-Track Functionality").

124. Letter from Steven Vine, Chief Privacy Officer, Datran Media, to Program Committee, W3C Workshop on Web Tracking and User Privacy (Mar. 25, 2011), *available at* http://www.w3.org/2011/track-privacy/papers/DatranMedia.pdf.

125. Narm Gadiraju, *Intel's Interest in W3C Tracking and Privacy Workshop*, http://www.w3.org/2011/track-privacy/papers/Intel.pdf.

126. Adrian Bateman, *Web Tracking Protection*, http://www.w3.org/2011/track-privacy/papers/microsoft-bateman.pdf; Sue Glueck & Craig Shank, *Tracking to Consensus: Coordination of Policy and Technical Standardization in Web Privacy Efforts*, http://www.w3.org/2011/track-privacy/papers/microsoft-glueck-shank.pdf.

127. *See* Center for Digital Democracy Comments, *supra* note 13; Comments of the Network Advertising Initiative, *In re* Preliminary FTC Staff Report on Protecting Consumer Privacy in an Era of Rapid Change: A Proposed Framework for Businesses and Policymakers (Feb. 18, 2011), http://naiblog.org/wp-content/uploads/2011/02/NAI_FTC_Comments.pdf; Corry & Steingruebl, *supra* note 64; Toubiana & Nissenbaum, *supra* note 64.

Our norm-generation process yields at least a partial criterion of adequacy for "do not track" technologies: they must give buyers enough power to prevent data collection in order to make the norm-generation process work. This is not to say that the technology alone must confer such power. Empowering buyers may require legal regulation that requires sellers to accommodate "do not track" technology instead of trying to circumvent it. Our claim is conditional: if we can appropriately empower users, relevant value-optimal informational norms will arise.